

MARK 5 TYPE M

MARK 5 TYPE M SERIES 3 TAPE RECORDER

The tape Recorder



with
all the
Refinements

BRENELL

Mark 5 Type 'M' Series 3

... incorporating all the outstanding features of the famous Brenell Mark 5 — PLUS a number of further refinements that make the Type "M S3" first choice of the enthusiast.

price 93 gns.

including 1,200 ft. Tape, 7" empty spool and Radio Coupling Cable

All the outstanding features of the Brenell Mark 5 Type M tape recorder are included in this latest model which incorporates the new Series 3 tape deck.

Experienced recordists will appreciate the facilities for Tape Monitoring, i.e. the ability to hear the recorded tape a fraction of a second after the recording has occurred, mixing of two input signals in the recording amplifier, superimposition and the availability to drive an external Hi-Fi amplifier with a correctly compensated signal at whatever tape speed is employed.

Add to these advantages the exceptional quality of workmanship and high standards of performance that distinguish all Brenell equipment, and you will see why the Type "M" undoubtedly offers the discriminating buyer the best value of all for his money. It is with every confidence that we invite your critical inspection of this top grade tape recorder.

Three Independent Outer Rotor Motors (capstan drive motor being synchronous) chosen for their high degree of speed stability with exceptional reliability and endurance.

Four Recording Speeds, $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ and 15 i.p.s., for maximum versatility under all circumstances.

Instant stop without spillage achieved even at high speeds by positive mechanical system of proved reliability.

Hinged Deck allows quick and easy access to deck, amplifier and power unit.

Pause key to halt tape movement temporarily when recording or replaying. Permits the easy omission of unwanted announcements or musical passages and therefore saves tape. With the facility of the Type "M S3" for monitoring by replaying simultaneously whilst making a recording, the pause key enables one to edit as one records.



Superimposing Facility. It is possible with the Type "M S3" to make one recording "on top of" an existing recording without erasing the original recording, so that a combined recording is obtained. This is effected by a switch which removes the tape from the erase head (instead of switching the erase head off), thus ensuring that bias power is always maintained at the correct level.

Mechanical Interlock prevents accidental erasure.

Screened Jack Plugs	...	...	...	...	6	3
Screened Cable Couplers	...	...	...	...	6	3
'Radio' Coupling Cables	...	...	...	...	10	0
(Jack Plug, 6 ft. of cable)						

Brenell

MARK 5 TYPE M SERIES 3

SPECIFICATION

Four tape Speeds $1\frac{7}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ and 15 IPS.

Separate Record and Replay Heads

Separate Record and Replay Amplifiers

Internal Speaker: 9" x 5" elliptical.

Wow and Flutter less than:

0.05% at 15 IPS. 0.1% at $7\frac{1}{2}$ IPS.
0.15% at $3\frac{3}{4}$ IPS. 0.25% at $1\frac{7}{8}$ IPS.

Working Voltage: 200/250v., 50 c/s or to order
110v., 60 c/s

Record/Replay/Response:

15 IPS., 40 c/s to over 20,000 c/s \pm 3dB.
 $7\frac{1}{2}$ IPS., 40 c/s to 18,000 c/s \pm 3dB.
 $3\frac{3}{4}$ IPS., 40 c/s to 13,000 c/s \pm 3dB.
 $1\frac{7}{8}$ IPS., 40 c/s to 6,000 c/s \pm 3dB.

Measured at Ext. Amp. Socket across 47 K ohm load.

Amplifier Response: 25 c/s to 26 Kc/s \pm 3dB.

Signal to Noise Ratio:

Unweighted—Including Hum, 45 dB at $7\frac{1}{2}$ IPS.

Recording Amplifier Sockets:

Microphone—1 mV (1 Megohm Impedance).

Radio—25 mV (500 Kilohms Impedance).

(May be mixed—separate gain controls).

Monitor for Headphones (2,000 ohms or higher).

Replay Amplifier Sockets:

Straight amp—

Input for High Impedance Microphone or Low Level
Radio Tuner:—(Sensitivity 30 mV. Impedance
1 Megohm).

Outputs **Ext. Speaker** (15 ohms).

External Amp. (200 mV. across 47 K ohm load).

Recording Medium:

Standard $\frac{1}{4}$ " plastic, coated tape on reels up to 8 $\frac{1}{2}$ " in diameter.

Track Width: .095" displaced to one edge.

Track Sense:

To International Standards (Upper Track operative—Tape
movement L to R across heads).

Number of Tracks: Two.

Playing Times per reel:

	$1\frac{7}{8}$ IPS.	$3\frac{3}{4}$ IPS.	$7\frac{1}{2}$ IPS.	15 IPS.
2,400' 7" Double Play Tape	8 hrs.	4 hrs.	2 hrs.	1 hr.
1,800' 7" Long Play Tape	6 hrs.	3 hrs.	1 $\frac{1}{2}$ hrs.	45 mins.
1,200' 7" Standard Tape	4 hrs.	2 hrs.	1 hr.	30 mins.

(add 50% to above times 8 $\frac{1}{2}$ " Reels of Tape)

Rewind Time:

Approximately 60 seconds per 1,200' of Tape.

Mixing Facilities. The Radio and microphone input circuits designed to enable the input signals to be mixed before recording. Each input has its own volume control.

Power Output: 2 Watts R.M.S.

Treble Control: 12 db variation at 15 Kc/s.

Bass Control: 12 db variation at 100 c/s.

Power Consumption: 120 Watts.

Overall Dimensions: 18" x 17" x 9".

Nett Weight: 40 lb.

Valve Compliment:

Recording Amplifier:	ECC 81	2 ECC 83
Replay Amplifier:	1EF86	1 ECC 83 1 EL 84
Oscillator:	EL84	
Power Unit:	EZ80	

Brenell Engineering reserve the right to alter the specification as modifications are made.

Sole Manufacturers

BRENELL ENGINEERING CO LTD

231-235 Liverpool Road London N1

Telephone NORth 8271 (5 lines)

GA4327/5M/168

The *Brenell* Mark 5 Series 3 Tape Deck

Fitted with 1 U/T Erase Head and
1 U/T R/PB Head, less Tape and Spool



This tape deck has been produced to meet the growing demands from tape recording connoisseurs, for a high-quality deck with a first-class performance.

Skillful design combined with high-grade engineering has made available a superb deck which will be the delight of every owner.

The new Mark 5 Series 3 deck incorporates all the proven features which have given Brenell tape decks their great reputation and makes available TODAY the deck of the future.

Simplicity of operation is still the keynote, two switches effecting the functions of record, playback, wind and rewind. Switch interlocking prevents misuse of the machine and a safety device is incorporated to prevent accidental erasure. The rewind and record playback switches are fitted with extended shafts to enable extra wafers to be added for individual requirements. This feature makes the deck quickly adaptable for use with a variety of high-fidelity equipment.

The large flywheel ensures great speed stability and the mechanical braking system gives quick stopping facilities without tape breakage or spillage.

A simple 'pause' mechanism enables easy editing of recordings, whilst the revolution counter enables the quick and easy location of selected items.

For superimposing purposes a switch has been incorporated to enable the tape to be removed from the erase head in order to record a second time without completely erasing the original recording, i.e. to add speech to music, so that a musical background is available. This method is preferable to switching off the erase head supply.

Normally the deck is supplied fitted with one erase and one record/playback head around which the Mark 5 Series 3 amplifier (described overleaf) is designed but there is room for up to four heads and the various combinations are listed below.

- 1 U/T Erase, 1 U/T Record/Playback
- 1 U/T Erase, 1 U/T Record, 1 U/T Playback
- 1 U/T Erase, 1 L/T Erase, 1 U/T R/PB, 1 L/T R/PB
- 1 2/2 Erase, 1 2/2 R/PB (1/2 track stereo)
- 1 2/2 Erase, 1 2/2 Record, 1 2/2PB (1/2 track stereo)
- 1 2/4 Erase, 1 2/4 R/PB (1/2 track stereo)
- 1 2/4 Erase, 1 2/4 Record, 1 2/4PB (1/2 track stereo)
- 1 2/4 Erase, 1 2/4 R/PB with track selector switch (1/2 track mono)

Specifications of standard 1/2 track Erase and R/PB heads listed in next column. Specifications of other heads and amplifiers available on request.

SPECIFICATION

Mains Voltage	200/250V 50c/s (110-120V 60c/s to order).			
Four Tape Speeds	1 1/2, 3 1/2, 7 1/2, 15 inches per second.			
Three Motors	Outer Rotor Types (Hysteresis synchronous for capstan drive).			
Wow and Flutter	Less than 0.05% at 15 l.p.s. 0.10% at 7 1/2 l.p.s. 0.15% at 3 1/2 l.p.s. 0.25% at 1 1/2 l.p.s.			
Spool Sizes	Any size up to 8 1/2 in. diameter.			
Place Indicator	Digital Revolution Counter.			
Heads	Erase—Low Impedance. Record/Playback—High Impedance.			
Record/Playback Head	Inductance	550 mH		
	Impedance	1 kc/s—3500 ohms		
	D.C. resistance	200 ohms		
	Bias voltage	50V		
	Bias current	550 µA		
	A.F. current	75 µA		
	Gap width	0.00012 in.		
Erase Head	Inductance	5 mH		
	Erase current	22 mA		
	D.C. resistance	12 ohms		
Playing Times per reel	1 1/2	3 1/2	7 1/2	15
	l.p.s.	l.p.s.	l.p.s.	l.p.s.
2,400' 7" D.P. Tape	8 hrs.	4 hrs.	2 hrs.	1 hr.
1,800' 7" L.P. Tape	6 hrs.	3 hrs.	1 1/2 hrs.	45 mins.
1,200' 7" S.P. Tape	4 hrs.	2 hrs.	1 hr.	30 mins.
	(add 50% to above times for 8 1/2" reels of tape)			
Rewind Time	Approximately 60 secs. per 1,200 ft. Tape.			
Size	Deck mask 15 1/2" x 12". Depth below plate, approximately 5". 8 1/2" spool overlap at rear 1 1/2", overlap on each side 1".			
Mounting	Horizontal.			
Weight	18 lb.			
Finish	Grey.			
Record/Playback Switches	These are fitted with extended centre spindles to enable extra wafers to be added.			

Brenell Mark 510 Series 3 Tape Deck for 10 1/2" NAB and Standard Spools

A modified Mark 510 Series 3 tape deck is available, which is basically the same as the standard Mark 5 Series 3 deck with the exception of the siting of the rewind and take-up motors and the provision of special adaptors to enable the standard type spool holders to accommodate 10 1/2" NAB spools.

Designated the 'Mark 510 Series 3' this deck is available for use on mains voltages of 200/250V 50 c/s (100-120V 60 c/s to order).

Finish: Grey.

10 1/2" spools overlap the deck by 3 1/2" to rear and 3 1/2" to each side.

Brenell Mark 5 Series 3 Record/Playback Amplifier

This high-quality amplifier is especially designed for use with the Brenell tape decks fitted with the 1/2 track heads specified overleaf. It has frequency compensation to CCIR standards at 7½ and 15 i.p.s., and further compensation for speeds below 7½ for which no specified standard is in operation.

An output of 2.5 watts gives adequate volume for most circumstances.

A further use is as a 'straight' amplifier, when it can be used independently of the deck to amplify radio, microphone and pick-up signals.

An output signal—suitably amplified and frequency corrected to give a flat response—is available from the co-axial socket at the rear of the amplifier. This signal may be fed to an external high fidelity amplifying system or tape recorder.

The amplifier, power unit and tape deck are designed to be coupled together by means of non-reversible plugs and sockets thus eliminating the need for soldering. It is a comparatively easy matter therefore to add tape recording and playback facilities to an existing installation.

SPECIFICATION

Frequency correction is available for four speeds—15, 7½, 3½ and 1½ i.p.s.—thus not only can the correct recording characteristic be selected, but also the correct playback characteristic. The correction circuits are independent of the deck speed control and may therefore be used as a tone control if desired.

Tone Control: A bass boost circuit provides 9 dB of lift at 100 c/s. This control is inoperative in the 'record' position of the function switch.

'Straight' Amplifier

When not required for recording or playback purposes, the am-



plifier may be used for the amplification of pick-up, radio unit or microphone by simply turning the function switch to the appropriate 'amplifier' position.

Input Sockets

Microphone. For high impedance type microphones (low impedance will require a matching transformer). Insertion of jackplug into the socket will automatically disconnect the R/Gram socket. Normally use this socket for the output from a mixer unit.

Radio. For gram, pick-up, radio, AM or FM tuners.

Output Sockets

Monitor. For use with high-impedance headphones (2,000/4,000 ohms). In circuit on record, playback and amplifier.

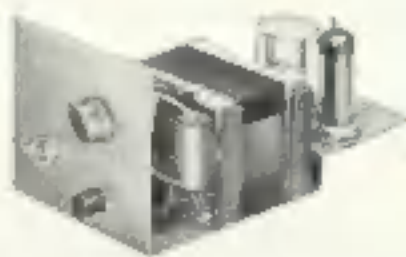
Tape Pre-Amplifier. For use with external amplifiers. A frequency corrected signal of approximately 500mV is available from a co-axial socket situated at the rear of the chassis.

Extension Speaker. This enables an extension speaker to be quickly coupled to the amplifier via a jackplug. A permanent speaker connection may be made by soldering to contact tags on jack socket (15 ohms matching).

Sensitivities

Microphone	2 millivolts into 1 megohms.
Radio/Gram	75 millivolts into 220 k/ohms.
Valves	EF86, ECC83, EL84, EM87.
Lamps	6.5 volts, .2 amps.
Power	H.T. 300V 50mA.
Requirements	L.T. 6.3V 2 amps.
Size	15½" wide by 4½" high and depth not exceeding 8".
Finish	Grey.
Weight	7 lb.

Power Unit



This unit contains mains transformer, rectifier valve, reservoir and smoothing condensers, humdinger (variable earthing to heaters), smoothing resistor, fused mains adjustment plug, mains switch and a three-hole non-reversible socket for mains input to the tape deck.

Weight 7 lb.

The Brenell Mixer Unit

This unit has been developed to meet the growing demand for an inexpensive and easy method of mixing the signals from microphones, radios and pick-ups.

Three input sockets (standard jack) are provided for the signals to be mixed and each input has its associated volume control.

The output socket is the take-off point for the mixed signals and this should be connected via screened plugs and co-axial cable to the microphone socket of the tape recorder.

Best results will be achieved with high impedance input signals. Some form of monitoring—such as by headphone—will enable the various signal strengths to be accurately ascertained.

Size: 4½" x 2½" x 2". Weight: 1 lb. Finish: Hammer Grey.



Brenell

BRENNELL ENGINEERING COMPANY LIMITED

231-5 Liverpool Road, London, N.1.
Telephone: NORTH 8271 (5 lines)



Brenell

the Mark 5, Series 3 tape recorder



THE MARK 5 SERIES 3

(including 1,200 ft. of tape,
spool and radio coupling cable.)
(Microphone extra)

74GNS

With recording level meter
(Microphone extra)

79GNS

SPECIALLY DESIGNED to meet the more exacting requirements of those who wish to employ tape recording for the teaching of music, drama, foreign languages or other educational purposes—in addition, of course, to normal recreational use and industrial purposes—the new Brenell Mark 5 Series 3 has a choice of four speeds and many other additional features of considerable value.

Indeed, as one studies the specification shown overleaf, it becomes obvious that no effort has been spared to ensure that the quality of reproduction attains a very high level.

Frequency correction is automatically applied at all tape speeds (15, $7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{1}{2}$), by means of a four-position switch. This ensures that the correct play-back characteristic—so

essential for optimum fidelity—is always available. The ultra-efficient sound-heads—the carefully designed oscillator circuit—the application of negative feedback to secure a uniform level throughout the wide frequency band—the use of a large internal elliptical speaker of high flux density—all these play their part in permitting the attainment of a standard of performance which will never fail to delight the most critical ear.

Finally, because it is realised that such a versatile instrument will be subjected to long and arduous service, Brenell engineers have developed a unit assembly system which, by permitting the instant disconnection of any of its several units, makes internal inspection, lubrication, adjustment or valve renewal, quick and easy operations.

Special features of the

Brenell

Mark 5, Series 3 tape recorder

Three Independent Outer Rotor Motors (capstan drive motor being synchronous) chosen for their high degree of speed stability with exceptional reliability and endurance.

Four Recording Speeds, $1\frac{1}{8}$, $3\frac{1}{2}$, $7\frac{1}{2}$ and 15 i.p.s. for maximum versatility under all circumstances.

Instant Stop without spillage achieved even at high speeds by positive mechanical system of proved reliability.

Pause Key to halt tape movement when recording or playing back. Permits the easy omission of unwanted announcements or musical passages.

Digital Rev. Counter enables any portion of a recording to be quickly located when desired.

Hi-Fi Amplifier is of advanced design and at the turn of a switch, can be used quite independently of the Tape Recorder as an amplifier for use with Radio Tuner, Pick-up or Microphone.

Recording Level Indicator. During recording the peak level is at all times clearly visible on the latest type of miniature magic eye or recording level meter. In this way, recordings of unvarying quality can be made without the slightest risk of failure.

Monitoring Facilities. Recordings may be monitored on high impedance headphones (2,000/4,000 ohms)—an invaluable feature when using a mixer unit.

Permits the use of $8\frac{1}{2}$ in. dia. Reels. For professional or other applications where recordings are required to be made at a speed of 15 i.p.s. the facility of being able to use $8\frac{1}{2}$ in. dia. reels will be greatly appreciated.

Fast Re-wind in either direction by switch which automatically lifts pressure pads and withdraws tape from contact with heads. Full reel of 1,200 ft. of tape can be completely rewound in 60 seconds.

Coloured Signal Lights to visually indicate the actual operation taking place and thereby eliminate all risk of error.

Superimposing Facility. It is possible with the Mark 5 Series 3 to make one recording on top of an existing recording without erasing the original, so that a combined recording is obtained. This is effected by a switch which removes the tape from the erase head (instead of switching the erase head off), thus ensuring that bias power is always maintained at the correct level.

Hinged Tape Deck allows quick and easy access to underside of tape deck, etc.

RECOMMENDED MICROPHONES

CRYSTAL—Acos 39/1

DYNAMIC—Gramplan DP4H, Lustraphone LFB59Z

RIBBON—Lustraphone VR64Z, Reslo RBT/H

See separate price list

Accessories:

Screened Jack Plugs	6s.	3d.
Screened Cable Couplers	6s.	3d.
'Radio' Coupling Cables (Jack Plug, 6 ft. of cable)	10s.	0d.

SPECIFICATION

TAPE SPEEDS: $1\frac{1}{8}$, $3\frac{1}{2}$, $7\frac{1}{2}$ and 15 i.p.s.

MOTORS: Three outer rotor (Synchronous Hysteresis type for driving capstan).

WOW AND FLUTTER:

Less than 0.05% at 15 i.p.s.
0.1% at $7\frac{1}{2}$ i.p.s.
0.15% at $3\frac{1}{2}$ i.p.s.
0.25% at $1\frac{1}{8}$ i.p.s.

RECORD PLAYBACK FREQUENCY RESPONSE:

15 i.p.s. 40 c/s to over 15 kc/s ± 2 dB
 $7\frac{1}{2}$ i.p.s. 40 c/s to 14 kc/s ± 3 dB
 $3\frac{1}{2}$ i.p.s. 40 c/s to 11 kc/s ± 3 dB
 $1\frac{1}{8}$ i.p.s. 40 c/s to 5 kc/s ± 3 dB

Measured at Ext. Amp Socket across 47 k ohm load.

AMPLIFIER RESPONSE: 40 c/s to 20 kc/s ± 3 dB

BASS CONTROL: 9 dB lift at 100 c/s.

SIGNAL/NOISE RATIO: Unweighted—including hum—45 dB.

SENSITIVITIES:

FOR PEAK MODULATION A MINIMUM SIGNAL OF:
MICROPHONE: 20mV (Impedance 1 Megohm).
RADIO: 75mV (Impedance 220 k ohms).

POWER OUTPUT: 100 watts r.m.s. into 15 ohm loudspeaker.

EXTERNAL AMP OUTPUT: 500mV across 47 k ohms.

IMPEDANCES:

Input: Microphone, 1 megohm (high).
Radio, 220 k ohm (medium).
Output: Loudspeaker, 15 ohms.
External amp, 47 k ohms.

SOCKETS:

MICROPHONE Standard Jack Socket.
RADIO Standard Jack Socket.
MONITOR Standard Jack Socket.
EXT. SPEAKER Standard Jack Socket.
EXT. AMPLIFIER Standard Couical Socket.

MONITORING: High Impedance Headphones (2000 to 4000 ohms) may be used for monitoring the recording amplifier.

RECORDING MEDIUM: Standard $\frac{1}{2}$ in. plastic coated tape on reels up to $8\frac{1}{2}$ in. in diameter.

TRACK WIDTH: 0.095 in. displaced to one edge.

TRACK SENSE: To International Standards. (Upper track operative. Tape movement L to R across heads).

NUMBER OF TRACKS: Two

PLAYING TIMES per reel:

	$1\frac{1}{8}$ i.p.s.	$3\frac{1}{2}$ i.p.s.	$7\frac{1}{2}$ i.p.s.	15 i.p.s.
1,400 ft. 7 in. D.P. Tape	8 hr	4 hr	2 hr	1 hr
1,800 ft. 7 in. L.P. Tape	6 hr	3 hr	1½ hr	45 min
1,200 ft. 7 in. Std. Play Tape	4 hr	2 hr	1 hr	30 min

(Add 50% to above times for $8\frac{1}{2}$ in. reels of tape).

REWIND TIMES: Approx. 60 seconds per 1,200 ft. of tape.

WORKING VOLTAGE: 200-250V 50 c/s (or to order 100-125V 60 c/s).

POWER CONSUMPTION: 100 watts.

VALVE COMPLIMENT:

1—EF86, 1—ECC83, 1—E887, 1—EL84, 1—E280

LOUDSPEAKER: 9 in. x 5 in. High Flux, Elliptical

CABINET: A specially designed wooden cabinet with excellent acoustic properties giving high quality from the internal elliptical speaker. Deck and amplifier protected by carefully designed masks.

FINISH: Grey with chromed fittings.

OVERALL DIMENSIONS: 18 in. x 12 in. x 9 in.

NETT WEIGHT: 40 lb.

Brenell Engineering reserves the right to alter the specification as modifications are made.

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BRENELL ENGINEERING CO. LTD

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